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August 1, 2000

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Re: Filing of New U.S. Utility Patent Application
Title: *System and Method For Transponder-Enabled Account Transactions*
Inventors: **Scott W. Rau, Scott P. Bertetti and Gerald A. Beechum, Jr.**

Dear Sir:

Attached is a new patent application for filing in the United States Patent and Trademark Office including twelve (12) pages of Specification, three (3) pages of Claims (numbered 1-20), one (1) page Abstract, four (4) sheets of Drawings (labeled Figs. 1-4), and an executed Joint Declaration.

The filing fee is calculated as follows:

| | | | | AMOUNT |
|---|----|------------------|---------|----------|
| | | BASIC FILING FEE | | \$690.00 |
| No. of Claims | | No. in Excess | Rate | |
| Number of Claims in Excess of: 20 | 20 | 0 | \$18.00 | .00 |
| Independent Claims in Excess of: 3 | 2 | 0 | \$78.00 | .00 |
| First Presentation of Multiple Dependent Claims | | \$ 130.00 | | |
| Reduce by 1/2 for Small Entity | | | | |
| | | | | |
| TOTAL FEE DUE | | | | \$690.00 |



August 1, 2000

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A check in the amount of \$690.00 is attached to cover the basic application filing. In the event of any variance between the amount enclosed and the Patent and Trademark Office charges, please charge or credit any difference to the undersigned's Deposit Account No. 50-0206.

Please direct all communication concerning this application to:

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Respectfully submitted,

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Dated: August 1, 2000

**SYSTEM AND METHOD FOR
TRANSPONDER-ENABLED ACCOUNT TRANSACTIONS**

FIELD OF THE INVENTION

5 The invention relates to the field of electronic commerce, and more particularly to the use of transponder-activated account transactions at point of sale or other locations.

BACKGROUND OF THE INVENTION

10 The use of electromagnetically-coupled transducers for commercial transaction processing has become increasingly popular in recent times. The advent of compact, inexpensive electronics, transponder-equipped point of sale equipment, and attendant information processing assets have enabled a variety of vendors to offer account-linked transaction systems. Those systems include,
15 for example, subway or other transportation devices, telephone calling devices, and others such as the SpeedPass™ offered by Mobil Corp. for gasoline point of sale transactions. In that and other systems, a receiver emits electromagnetic signals to a device in proximity to a gasoline pump over radio frequencies (RF), activating an embedded transponder within the transaction device. The
20 transaction device is identified by some sort of identification information, which information is then relayed from the point of sale to an offsite information processing facility. However, these types of distributed systems suffer from more than one disadvantage.

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For one, transactions made according to that technology require that separate offsite computing facilities be accessed, since the transponder in encoded with information identifying the transponder but not the account information necessary to complete the transaction. Processing times and time
5 to completion of transactions are therefore increased, and the expense of linking and maintaining information processing facilities to service the point of sale request is significant. Moreover, the initiation of new accounts to use such wireless vending points requires backend processing facilitates to enter a new user's account to the remote data processing facility, as well as to encode and
10 associate the transponder with particular new accounts. More streamlined, convenient and flexible transaction technology is desirable.

SUMMARY OF THE INVENTION

The invention overcoming these and other drawbacks in the art relates
15 to a system and method for transponder-activated transactions, generally involving the presentation and sensing of an electromagnetically coupled transponder to an RF-enabled point of sale system. In the practice of the invention, the transponder may be preferably encoded with not merely identifying or serializing information, but also account information which may
20 be used to authorize or record transactions at the instant of sale, so that remote data processing may not be necessary. Users of the transponder of the

invention may link the device to more than one type of account, and activate the transponder using Web or other network-enabled interfaces.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The invention will be described with reference to the accompanying drawings, in which like elements are referenced by like numerals.

Fig. 1 illustrates an overall transaction architecture according to one embodiment of the invention.

Fig. 2 illustrates an overall architecture of the invention according to a
10 second embodiment of the invention.

Fig. 3 illustrates an activation architecture for the initiation of user accounts according to the invention.

Fig. 4 illustrates a flowchart of transaction processing according to the invention.

15

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

As illustrated in Fig. 1, in a first embodiment of the invention, an overall point of sale architecture includes a transponder 102 which communicates via an RF link 104 to a receiver 106. The transponder 102 may
20 be or include any of several known electromagnetically coupled devices, generally activated by proximity to an RF-enabled receiving unit, such as receiver 106. Transponder 102 may, for instance, contain an electromagnetic

coil antenna for inductive coupling to receiver 106, thereby being energized with small but sufficient electric current to activate embedded electronics within transponder 102. Those electronics may include memory such as CMOS memory, logic gates, filters for isolating discrete transmission frequencies and other elements known in the art. In one embodiment, transponder 102 may be programmable and able to receive updated programmable instructions via RF link 104, as well as to have electronic memory erased or updated during transactions. Receiver 106 may include an electromagnetic antenna to couple with transponder 102, generally within the range of a few feet of the device.

10 In the embodiment illustrated in Fig. 1, the receiver 106 is connected to a point of sale (POS) device 108 for conducting a commercial or other transaction. For instance, the point of sale device 108 may be or include any of several commercially known electronic cash registers or related transaction processing equipment, such as point of sale terminals manufactured by Sharp Corp. or others. In one embodiment of the invention, transponder 102 may be embedded within a personal article for convenience, aesthetic and affinity purposes. In that regard, the invention has been integrated in one implementation within a fully functional watch manufactured by the Swatch Corporation. Embedding in other personal articles, such as key chains, pagers, 15 clothing or other items is also possible.

In the operation of the invention, a user who has subscribed to the account system of the invention may approach the receiver 106 at the point of

sale device 108 to initiate and complete a purchase or other transaction, such as at a restaurant or grocery market checkout line, or other points of sale. In the embodiment illustrated in Fig. 1, transponder 102 contains an encoded transponder ID 110, which may for instance be a 5-digit number or other
5 identifying information. In this embodiment, transponder 102 may also store an account table 112 directly recording account information for the subscribed user of the transponder 102. The account table 112 may be or include, for instance, an indication of an account number, balance, limit and other information for a debit account, a cash account, a credit card account, special
10 premises account for internal use such as by employees, or other account information associated with users of the system.

In the implementation of this embodiment of the invention, receiver 106 is configured to receive the account table 112 and apply an amount being executed at the point of sale device 108 to the account reflected within the
15 account table 112. For instance, a patron who has subscribed to an account according to the system of the invention may approach receiver 106 in a restaurant line and wave a watch or other article containing transponder 102 in proximity of the receiver 106. When transponder 102 comes within range of receiver 106, transponder 102 may be inductively coupled to the coils of an
20 electromagnetic antenna within receiver 106 inducing electrical energy within transponder 102, to establish the RF link 104 with the receiver 106. Upon activation of transponder 102 and radiation of transponder ID 110 to the

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receiver 106, the receiver 106 may respond with an acknowledge signal to the transponder 102. The point of sale device 108 may indicate on a display screen or otherwise that a transaction is ready to be commenced. Once the point of sale device 108 generates total amount due for the transaction, the receiver 106
5 may interrogate transponder 102 to obtain account table information from account table 112 for application to the sale.

For instance, if a patron has purchased a meal in a restaurant line at point of sale device 108, the total purchase price may be validated against available credit, available cash or other account-specified balances within
10 account table 112 for completion of the transaction. Conversely, if the amount of the transaction cannot be validated against account table 112, the point of sale device 108 may indicate "cash required" or another message that transponder validation or authorization has failed. If the transaction amount is validated, receiver 106 enters the transaction amount, recalculates an account
15 balance for storage within account table 112 and transmits the revised account table 112 information over the RF link 104 to the transponder 102. A transaction completion signal may be emitted by receiver 106, which in one embodiment may turn off or decouple the transponder 102 via RF link 104.

Among other advantages, because the receiver 106 and other transaction
20 elements do not need to resort to offsite transaction processing, conduct of the transaction from initiation through approval and completion are completed quickly, often virtually instantaneously to a subscriber at the point of sale. It

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(Time Division Multiple Access) link such as a cellular phone channel, a GPS (Global Positioning System) link, CDPD (cellular digital packet data), a RIM (Research in Motion, Limited) duplex paging type device, a Bluetooth radio link, or an IEEE 802.11-based radio frequency link. Communications link 120
5 may yet further be, include or access any one or more of an RS-232 serial connection, an IEEE-1394 (Firewire) connection, an IrDA (infrared) port, a SCSI (Small Computer Serial Interface) connection, a USB (Universal Serial Bus) connection or other wired or wireless, digital or analog interface or connection.

10 The registration server 122 may be or include, for instance, a workstation running the Microsoft Windows™ NT™, Windows™ 2000, Unix, Linux, Xenix, IBM AIX, Hewlett-Packard UX, Novell Netware™, sun Microsystems Solaris™, OS/2™, BeOS™, Mach, Apache, OpenStep™ or other operating system or platform.

15 The registration server 122 may communicate with client workstation 118 to receive preassigned information related to transponder 102, such as transponder ID 110 which may be printed by sticker on a watch or other article housing the device, for entry into a database 126 within registration server 122 and the setting up of an account. The account may illustratively include or be
20 more than one type of account 124a ... 124n, such as cash accounts, debit accounts, credit card accounts, special purpose vending accounts, telephone card accounts, or others. The registration server 122 may validate the

For instance, the registration 122 may accept a preexisting credit card number for registration with the transponder 102 and execution of future transactions. Once new account information is established, the registration server 122 may communicate via network connection to receiver 106 to update subscriber registration tables within the database 126, receiver 106, point of sale device 108 or other associated hardware to authorize transactions at the point of sale. The paperwork, delay, possibility for error and other drawbacks of paper-based back end account registration is thereby avoided.

A second illustrative embodiment of the invention is shown in Fig. 2, generally involving a processing architecture similar to that of Fig. 1. In this embodiment, a transponder 102 again communicates via RF link 104 with receiver 106 to effectuate point of sale or other transactions. However, in the embodiment of Fig. 2 a portion or all of account table 112 or other information stored in transponder 102 in the first embodiment may be offloaded to economize on the necessary electronics, power consumption and other properties of transponder 102. In the embodiment illustrated in Fig. 2, the point of sale device 108 is additionally connected to a transaction server 116 via communications link 114, for the purpose of authorizing in whole or in part transactions presented for payment using transponder 102. Communications

link 114 may be, include or access communications resources similar to communications link 120.

In this embodiment, part or all of the information of account table 112 may be stored in hard disk or other storage of transaction server 116.

5 Transaction initiation begins in the same manner as the embodiment illustrated in Fig. 1, however, after acknowledgments are exchanged between point of sale device 108 and transponder 102 and a transaction is set up, the point of sale device 108 may communicate with transaction server 116 to validate a transaction amount or other information against account information stored in
10 the transaction server 116.

While this implementation involves additional hardware and communications link 114, if transaction server 116 is co-located with the point of sale device 108, such as in a restaurant or retail outlet, communication delays may be minimal. Furthermore if the transaction server 116 is dedicated to
15 processing transactions only at the site of point of sale device 108 or closely grouped facilities, processing burdens may be comparatively modest. In another embodiment of the invention, transaction server 116 may communicate with remote credit file databases or other information resources before authorizing or completing a transaction initiated over RF link 104 at receiver
20 106, when circumstances may permit some execution delay to be acceptable. Alternatively, in another embodiment of the invention the point of sale device 108 may perform a preliminary authorization for transactions presented at the

receiver 106, to collect and temporarily store transactions, for instance over 2 or 3 hour periods, for batch processing remotely via transaction server 116. Since the majority of transactions typically reconcile without difficulty, this implementation permits more-immediate completion while still checking on
5 account validations at frequent intervals.

Overall transaction processing is illustrated in the flowchart of Fig. 4. In step 202, processing begins. In step 204, the receiver 106 is presented with transponder 102 within range of electromagnetic coupling, such as inductive coupling. In step 206, transponder 102 is activated, for instance by inductive
10 energization of its circuitry. In step 208 transponder 102 may communicate transponder ID 110, which the receiver 106 acknowledges with an acknowledge signal over RF link 104 in step 210.

In step 212, transaction information such as purchase amount is entered at point of sale device 108, for instance by a check out clerk or other attendant.
15 In step 214, transaction table 112 or other account information may be interrogated to determine whether account balances or other account parameters permit the pending transaction at the point of sale device 108. If the transaction is not validated, in step 216 a "cash required" or other message is signaled at point of sale device 108, and processing proceeds to step 224 whole processing
20 ends.

If the account to be applied to the pending transaction is validated at step 214, in step 218, the point of sale device 108 and receiver 106

communicate with transponder 102 to indicate transaction acceptance, and modify information within account table 112 if appropriate. In step 220, an end of transaction signal is sent to transponder 102 and in step 222, transponder 102 decouples from the receiver 106. In step 224, processing ends.

IN THE CLAIMS

What is claimed:

- 1 A system for transponder-enabled transactions, comprising:
a wireless interface to a transponder, the wireless interface for coupling
5 to the transponder at a point of sale; and
a transaction interface, communicating with the wireless interface, the
transaction interface operative to communicate with at least one network-
enabled transaction device to permit the execution of a transaction at the point
of sale.
- 10 2. The system of claim 1, wherein the wireless interface comprises
at least one of an RF interface and an infrared interface.
3. The system of claim 1, wherein the transaction interface
comprises a connection to a point of sale device.
4. The system of claim 3, wherein the point of sale device
15 comprises an electronic sale register.
5. The system of claim 1, wherein the transponder stores account
information which is accessible to execute the transaction.
6. The system of claim 5, wherein the account information
comprises at least one of transponder ID information, account number
20 information, account type information, account balance information, and
account limit information.

7. The system of claim 1, wherein the transponder is embedded in a personal article.

8. The system of claim 1, further comprising a data interface to a data processing facility, the data processing facility communicating with the transaction device to execute the transaction.

9. The system of claim 1, further comprising a network registration interface, the network registration interface permitting an account subscriber to register the transponder with an account.

10. The system of claim 1, wherein the transaction interface is operable to communicate with a transaction server to execute the transaction.

~~11.~~ A method of transponder-enabled transactions, comprising:
a) coupling to a transponder at a point of sale via a wireless interface; and
b) communicating with at least one network-enabled transaction device via a transaction interface to permit the execution of a transaction at the point of sale.

12. The method of claim 11, wherein the wireless interface comprises at least one of an RF interface and an infrared interface.

13. The method of claim 11, wherein the transaction interface comprises a connection to a point of sale device.

14. The method of claim 13, wherein the point of sale device comprises an electronic sale register.

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15. The method of claim 11, further comprising a step of c) storing account information which is accessible to execute the transaction in the transponder.

16. The method of claim 15, wherein the account information
5 comprises at least one of transponder ID information, account number
information, account type information, account balance information, and
account limit information.

17. The method of claim 11, wherein the transponder is embedded in a personal article.

10 18. The method of claim 11, further comprising communicating
with a the data processing facility to execute the transaction.

19. The method of claim 11, further comprising a step of e) permitting an account subscriber to register the transponder with an account via a network registration interface.

15 20. The method of claim 11, wherein the transaction interface is operable to communicate with a transaction server to execute the transaction.

Block diagram illustrating a cashless payment system:

- 102**: Transponder (labeled "TRANSPONDER").
- 104**: Signal line connecting the transponder to the receiver.
- 106**: Receiver (labeled "RECEIVER").
- 108**: Cashless Payment System (includes a display and keypad).
- 112**: Card (labeled "CARD") with fields:
 - TRANS. ID
 - ACCOUNT NO.
 - BALANCE
 - ...

FIG. 1

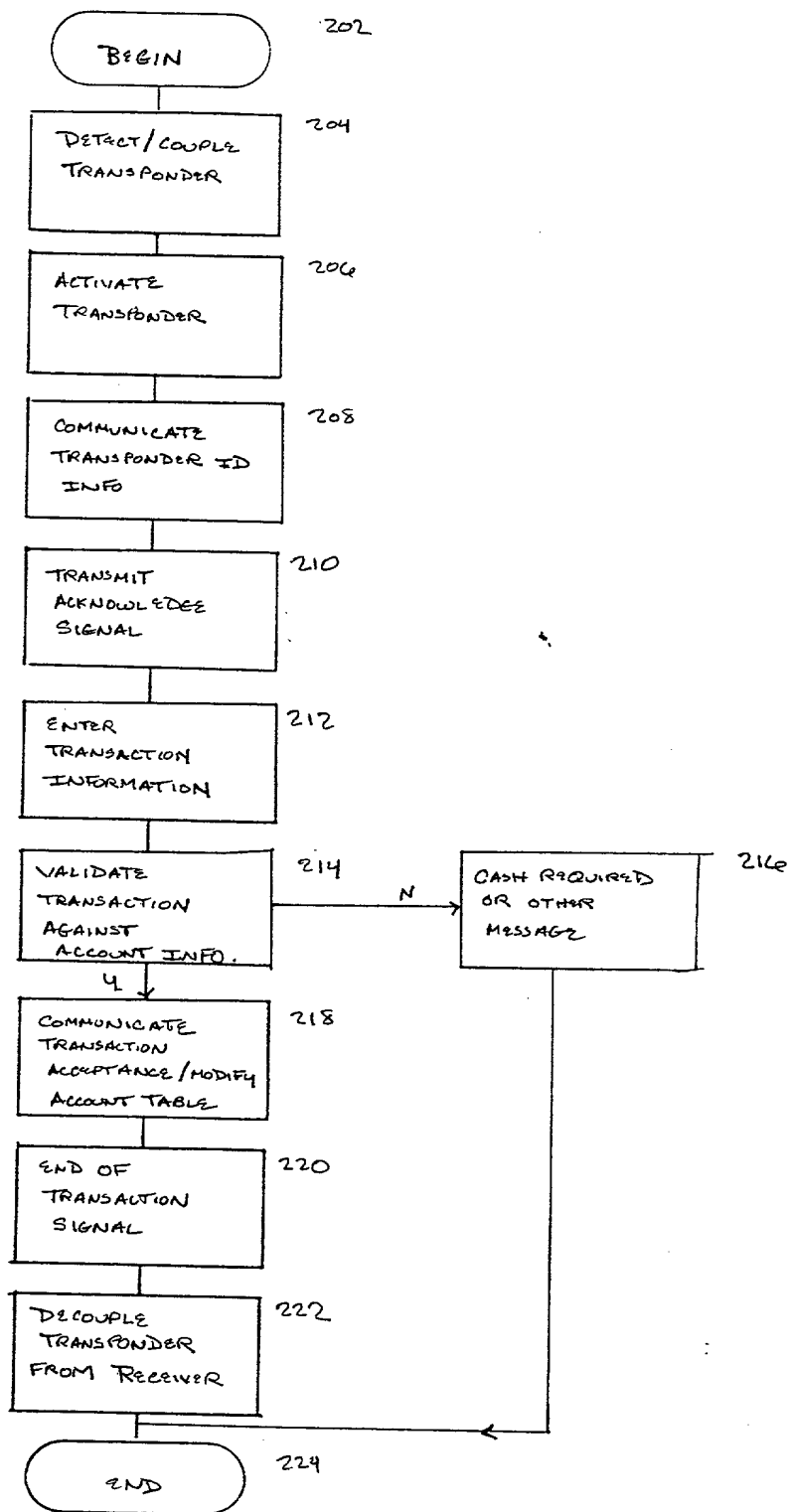
[illegible]

FIG. 4

JOINT DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

As the below named inventors, we hereby declare that:

Our residences, post office addresses and citizenship are as stated below next to our names;

We believe that we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled SYSTEM AND METHOD FOR TRANSPONDER-ENABLED ACCOUNT TRANSACTIONS, the specification of which

☒ is attached hereto.
☐ was filed on _____ as Application Serial Number _____ and was
 amended on _____
 (if applicable)

We hereby state that we have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to in this declaration.

We acknowledge the duty to disclose all information known to us to be material to the patentability of this application, as defined in 37 C.F.R. § 1.56.

We acknowledge the duty to disclose to the Office all information known to us to be material to patentability as defined in § 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Prior Foreign Application(s)

We hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

| Country | Application Number | Date of Filing (day, month, year) | Date of Issue (day, month, year) | Priority Claimed Under 35 U.S.C. 119 |
|---------|--------------------|--------------------------------------|-------------------------------------|--|
| | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |

Prior United States Provisional Application(s)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below

| Application Serial Number | Date of Filing (day, month, year) |
|---------------------------|--------------------------------------|
| | |

Prior United States Application(s)

We hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

| Application Serial Number | Date of Filing (day, month, year) | Status - Patented, Pending, Abandoned |
|---------------------------|--------------------------------------|--|
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| | | |

And we hereby appoint, both jointly and severally, as our attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith the following attorneys, their registration numbers being listed after their names:

Thomas J. Scott, Jr., Registration No. 27,836; Stanislaus Aksman, Registration No. 28,562; James G. Gatto, Registration No. 32,694; Christopher C. Campbell, Registration No. 37,291;; Henry C. Su, Registration No. 37,738; Brian M. Buroker, Registration No. 39,125; Charles F. Hollis, Registration No. 40,650; Jonathan D. Link, Registration No. 41,548; Kevin T. Duncan, Registration No. 41,495; Charles B. Lobsenz, Registration No. 37,857; George Georgellis, Registration No. 43,632; Stephen T. Schreiner, Registration No. 43,097; Christopher J. Cuneo, Registration No. 42,450; Raphael A. Valencia, Registration No. 43,216; Scott D. Balderston, Registration No. 35,436; Steven P. Klocinski, Registration No. 39,251; Yisun Song, Registration No. 44,487; Jennifer A. Albert, Registration No. 32,012; Kerry Owens, Registration No. 37,412; Milan M. Vinnola, Registration Number 45,979; Devin S. Morgan, Registration No. 45,562; Andrew J. Ririe, Registration No. 45,597; Carl Benson, Registration No. 38,378; Thomas E. Anderson, Registration No. 37,063; Thomas Blasey, Registration No. 33,475; Robin Clark, Registration No. 40,956; Herbert V. Kerner, Registration No. 42,721 and René A. Vazquez, Registration No. 38,647.

All correspondence and telephone communications should be addressed to Hunton & Williams, 1900 K Street, N.W., Washington, D.C. 20006-1109, telephone number (202) 955-1500, which is also the address and telephone number of each of the above listed attorneys.

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature _____ Date _____

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